

REMARKS

In response to the Advisory Action dated November 21, 2003, reconsideration and allowance of the present application are respectfully requested. Claims 1-10, 18 and 26 had previously been canceled. Claims 11-17, 19-25 and 27-32 remain pending, of which claims 14, 22 and 29 are dependent.

In the Advisory Action, the Examiner has maintained the rejections set forth in the Final Office Action dated July 31, 2003. In the Final Office Action, claims 11-16, 19-24 and 27-31 had been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,181,826 (Weldy) in view of U.S. Patent No. 5,838,834 (Saito) and further in view of U.S. Patent No. 5,648,816 (Wakui). On page 5 of the Final Office Action, claims 17, 25 and 32 were rejected under 35 U.S.C. §103(a) as being unpatentable over the Weldy, Saito and Wakui patents in further combination with U.S. Patent No. 6,263,106 (Yamagata).

In the "Response To Arguments" set forth on page 2 attached with the Advisory Action, the Examiner asserts that each of the cited patents, when considered individually, includes various features from the claims. However, the Examiner's response does not provide the suggestion or motivation for combining the relied upon teachings, as required to establish a *prima facie* case of obviousness.

On pages 2-3 of the Advisory Action, the Examiner acknowledges that neither the Weldy nor Saito patents were relied upon "to show that space in a secondary storage area of an image storage device is released if insufficient space is available in the primary

storage area of the image storage device to store the first compressed image data set". The Examiner asserts that the Wakui patent was relied upon as disclosing this feature. Towards the bottom of page 3 of to the Advisory Action, the Examiner asserts:

... Wakui specifically teaches that image data is primarily recorded in the IC memory card 31. Wakui also teaches that if the IC card 31 is not correctly connected to the connector [or] if there is not enough remaining storage capacity of the image data, the image data captured by the camera is stored in the image flash memory (20) (col. 8, lines 51-69; col. 14, lines 9-13). In order to increase the utilization efficiency of the image flash memory (20), Wakui further teaches that the recorded image in the flash memory (20) can be selectively erased (col. 1 lines 44-46; col. 2 lines 60-64; col. 3 lines 56-58; col. 17 lines 38-40; col. 18 lines 12-44; col. 21 lines 14-19)....

In the sentence bridging pages 3-4 of the Advisory Action, the Examiner asserts:

... The Examiner notes that the claimed language of claims 11-17, 19-25 and 27-32 only broadly claims "releasing space in a second storage area of the image storage area device if insufficient space is available in a primary storage area of the image storage device to store the first compressed image data set".

In view of the above, the Examiner believes that the broadest interpretation of the presently claimed invention does in fact read on the cited references for at least reasons discussed above, and as stated in the detailed final Office Action as mailed on 07/31/2003.

Contrary to the Examiner's assertions, there would have been no motivation or suggestion to have combined the multiple patents relied upon in the Office Action in the manner suggested by the Examiner for reasons discussed in Applicant's previous response. However, by the foregoing amendment, independent claims 14, 22 and 29 have been amended to clarify the claimed feature regarding the releasing of space in a secondary storage area when insufficient space is available in a primary storage area. For example,

claim 14 recites a feature of releasing space in a secondary storage area (i.e., storage area that is used to store a compressed image data set for reproducing an image with a higher quality level), where insufficient space is available in a primary storage area to store an image data set for reproducing an image at a first (i.e., lower) quality level.

As described on page 2 of Applicant's specification, exemplary embodiments of the present invention provide for higher quality digital images in a digital camera system. Image compression is performed using first and second image data quantizations to produce a primary compressed data set and an auxiliary compressed data set. The primary compressed data set is sufficient to reproduce an image at a first quality level. The primary and auxiliary data sets can be combined to reproduce the same image at a higher quality level. As images are captured, primary and auxiliary data sets are formed for each image and the primary data set is stored in a primary storage area. If storage space is available, the auxiliary data set is stored in a secondary storage area. When the primary storage area becomes filled, space in the secondary storage area containing auxiliary data sets is released to store additional primary data sets. Thus, exemplary embodiments of the present invention add intelligence to the manner by which compressed digital image data is stored in and/or released from a picture memory.

The foregoing features are broadly encompassed by Applicant's independent claim 14. Claim 14 is directed to a method for processing images in a digital camera wherein the digital camera includes an image storage device having primary and secondary storage areas. The method recites generating from a raw image, including employing a first quantizing step, a first compressed image data set suitable for reproducing substantially the

entire image at a first quality level. The first compressed image data set is stored in the primary storage area. The method also recites generating from the raw image, including employing a second quantizing step independent of the first quantizing step, a second compressed image data set which when combined with the first compressed image data set reproduces substantially the entire image at a second, higher quality level. The second compressed image data set is stored in the secondary storage area. In accordance with the claim 14 method, space in the secondary storage area of the image storage device used to store the second compressed image data set is **released** to store the first compressed image data set when insufficient space is available in the primary storage area of the image storage device used to store the first compressed image data set.

None of the patents to Weldy, Saito, Wakui or Yamagata, even when considered in the combination relied upon by the Examiner, teach or suggest such a method.

The Weldy patent is directed to reconstructing an M level image by forming at least two non-dependent digital images from an original digital image. The two non-dependent images are formed by quantizing an original M level image to two M/2 level images, one being rounded down in value and the other being rounded up in value (see Abstract). An image having a higher resolution than either of the non-dependent M/2 digital images can be formed by combining and averaging the non-dependent images. As shown in Figure 1 of the Weldy patent, the digital images can be written onto a compact disk by a CD writer 5. A CD player 7 is used to read selected images from the compact disk and to reconstruct and to forward the selected images for display on a standard TV display 8, a thermal printer 9, or a computer monitor.

Column 3, lines 31-45 of the Weldy patent describe the receipt of a digitized image from a scanner 3 having high resolution which permits certain printers to print images that correspond to photographic quality originals. This portion of the Weldy specification describes that by manipulating the images through a hierarchical residual based scheme, a number of images of differing resolution levels can be generated and written on the compact disk. Portions of the specification referred to by the Examiner, such as column 7, lines 63-67, describe storing representations of images quantized using different quantizers for purposes of reconstructing the image for viewing or printing.

The Saito patent was cited by the Examiner as disclosing that "it is well known in the art to process and compress digital images having different quantizing and coding steps in a digital camera." The Saito patent is directed to an image processing apparatus and method which temporarily stores frequency-converted data to quantize the data. The Saito patent discloses a multi-stage quantization and coding based on quantization errors generated in the quantization. The Saito patent does not disclose or suggest a process employing a second quantizing step independent of a first quantizing step, as recited in Applicant's independent claims. Rather, this patent discloses generating compressed image data that includes multi-stage quantization, where each stage is dependent on the previous stage in a manner as illustrated in Figure 1 and as described at column 7, lines 4-20 of the Saito patent.

Because the Saito patent is directed to a single quantization procedure, there would have been no motivation or suggestion to combine the quantization process of the Weldy patent with that of the Saito patent. Moreover, any combination of the features described

in the Weldy and Saito patents in the manner suggested by the Examiner would not have resulted in releasing space to store images as presently claimed. The Saito patent fails to overcome the absence of teaching or suggestion in the Weldy patent to release space in a secondary storage area of an image storage device when insufficient space is available in a primary storage area of the image storage device to store a first compressed image data set, as recited in Applicant's independent claims.

The Examiner refers to Wakui's disclosed "IC memory card 31" as satisfying Applicant's claimed primary storage area, and refers to the "image flash memory 20" of Wakui as the claimed secondary storage area. The Examiner asserted on page 4 of the Final Office Action that "it would have been obvious to one of ordinary skill in the art to modify the system of processing images in a digital camera taught in Weldy and Saito by having primary and secondary storage areas and allowing recorded image data to be selectively erased or released from the secondary storage area so as to ensure that no images are lost due to the lack of capacity of the primary storage area."

There would have been no motivation or suggestion to have combined the various features from Weldy, Saito and Wakui patents in the manner suggested by the Examiner. Moreover, despite the provision of the IC memory card 31 and image flash memory 20, the Wakui patent, even when considered in combination with the Weldy and Saito patents in the manner relied upon by the Examiner, does not teach or suggest the presently claimed invention. The Wakui patent is directed to a video camera having an external IC memory card 31 which can be detachably attached to the still video camera 1. An IC memory card control circuit 15 functions as a "remaining memory capacity detecting means" to detect

the remaining storage capacity of the IC memory card 31. See column 5, lines 42-47 and 56-59. As discussed at column 6, beginning with line 32, the video camera 1 includes an image flash memory 20. A flash memory control circuit 19 functions as a detecting means for detecting the remaining capacity of the image flash memory circuit 20. As described at column 6, lines 45-50, the flash memory control circuit 19, the IC memory card control circuit 15 and the system controller 2 can record image data in the image flash memory 20 or the IC memory card 31. An erasing means is provided for erasing data recorded in the image flash memory 20 or the IC memory card 31.

However, the Wakui patent teaches away from the presently claimed invention, because this patent fails to teach or suggest **releasing space** in a secondary storage area of an image storage device when insufficient space is available in a primary storage area of the image storage device to store a first compressed image data set. Wakui is directed to using **available space** of the image flash memory 20 when the IC memory card 31 is unavailable. There are only specific conditions in which image data is stored in the image flash memory 20, and none of these conditions correspond to **releasing space** in the image flash memory 20. Moreover, the Wakui patent is not directed to the storage of compressed image data sets as presently claimed.

The Wakui patent describes storage of image data in the image flash memory 20 under specific conditions set forth, for example, at column 8, line 66 through column 9, line 6. This portion of the Wakui patent describes storing image data in the image flash memory 20 when the IC memory card is not correctly connected, or if there is not enough storage capacity for image data in the IC memory card 31. This criteria for storing data in

the image flash 20 is also set forth at column 14, lines 9-12. However, there is no teaching or suggestion that space which had been allocated to store a specific type of information in the flash memory 20 should be released to store a different type of information.

Thus, the Wakui patent, even when considered with the Weldy and Saito patents, does not teach or suggest "releasing space" in the image flash memory 20 when insufficient space is available in a primary storage areas used to store a first set of compressed image data. Moreover, Wakui does not release space of a secondary storage area which had been allocated to store a second compressed image data set of a given image. These three patents, even when considered in combination do not teach or suggest specifically "releasing" space of a memory which had been previously allocated to store compressed image data associated with an image.

Thus, independent claim 14 is allowable over the Weldy, Saito and Wakui patents regardless of whether these patents are considered individually or in the combination relied upon by the Examiner. Independent claims 22 and 29 recite similar features and are similarly considered allowable.

The Yamagata patent was cited in the rejection of claims 17, 25 and 32. However, this patent fails to overcome the deficiencies noted with respect to independent claims 14, 22 and 29. As such, dependent claims 17, 25 and 32 are allowable for at least the reasons already discussed.

The Yamagata patent is directed to an image data compression device wherein a number of image data files recorded by the image data compression device are stored in an IC in a memory card either uncompressed, in a low-compression format, or in a high-

compression format (see Abstract). As described in the summary portion of the Yamagata patent, an object of this patent is to provide an image data compression device which enables a user of a still video camera to select image data that is inhibited from being compressed. This patent describes using data flags associated with image data files, where the data flags are set at the time of recording. The compression of a recorded image data file is inhibited if an associated flag has a predetermined status. Image data files which are already recorded in the recording medium can be compressed to a next higher level of compression to increase remaining capacity, as described in the summary portion of this patent.

There would have been no motivation or suggestion to have used a quantization technique as described in the Weldy patent with the features described in the Yamagata patent. Moreover, even if the Weldy, Saito, Wakui and Yamagata patents could have somehow been combined in a manner suggested by the Examiner, the presently claimed invention would not have resulted.

The Yamagata patent does not teach or suggest **releasing** space in a secondary storage area of an image storage device when insufficient space is available in a primary storage area of the image storage device to store a first compressed image data set, as recited in Applicants' independent claim 14. Rather, the Yamagata patent is merely directed to increasing space by increasing the order of compression of image data files in a common memory area.

Thus, none of the documents cited by the Examiner, considered individually or in the combinations relied upon, teach or suggest generating a first compressed image data set

(using a first quantizing step), for producing substantially the entire image at a first quality level, the first compressed image data set being stored in a primary storage area; a second compressed image data set which when combined with the first compressed image data set reproduce substantially the entire image at a second, higher quality level, the second compressed image set being stored in the secondary storage area; and releasing space used to store the second compressed image data set in the secondary storage area to store the first compressed image data when insufficient space is available in the primary storage area.

Independent claim 14 is therefore allowable over the Weldy, Saito, Wakui and Yamagata patents, considered individually or in the manner relied upon by the Examiner. Independent claims 22 and 29 recite similar features and are also allowable. The remaining claims depend from these three independent claims and are further considered allowable.

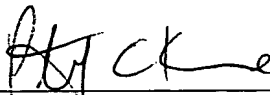

All rejections and objections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance, and a Notice of Allowance is respectfully solicited.

Respectfully submitted,

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Date: December 31, 2003

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